



**INTERCONNECTION
INNOVATION e-XCHANGE**
U.S. DEPARTMENT OF ENERGY

Interconnection Workforce and Training

7/20/23

An initiative spearheaded by the Solar Energy Technologies Office and the Wind Energy Technologies Office

Meeting Notes

Notes synthesizing keys points, insights and questions from the meeting can be found here: [Box Link](#)

The first half of this Teams call is being recorded and may be posted on DOE's website or used internally. If you do not wish to have your voice recorded, please do not speak during the call. If you do not wish to have your image recorded, please turn off your camera or participate by phone. If you speak during the call or use a video connection, you are presumed consent to recording and use of your voice or image.

Agenda

- Introduction to i2X Solution e-Xchanges
- What Can We Learn from Clean Energy Workforce Development?
- Initial Stakeholder Feedback on Interconnection Workforce Challenges and Solutions
 - Key Challenges
 - Potential Solutions
- Key Questions Regarding the Interconnection Workforce
 - Key Information-Gathering Questions
 - Case Study: FERC Order No. 845 Reporting



Interconnection Innovation e-Xchange (i2X)

Mission: To enable a simpler, faster, and fairer interconnection of clean energy resources while enhancing the reliability, resiliency, and security of our distribution and bulk-power electric grids



Stakeholder Engagement

Nation-wide engagement platform and collaborative working groups



Data & Analytics

Collect and analyze interconnection data to inform solutions development



Strategic Roadmap

Create roadmap to inform interconnection process improvements



Technical Assistance

Leverage DOE laboratory expertise to support stakeholder roadmap implementation



Key Outcomes from Our e-Xchange Meetings



- Inform and formulate a **publicly available**, strategic roadmap for interconnection
 - Topical challenges and issues
 - Practical solutions to implement and scale
 - Knowledge and data gaps and new solutions to pilot
 - Success goals and measures of success
- Summary documentation for each meeting regarding ideas discussed and opportunities for targeted stakeholder action
- Provide platform for ongoing engagement before and after meetings
- **Longer term vision** → Solution e-Xchanges to continue building a national forum for all stakeholders as a community of practice, excellence, and innovation



i2X Solution e-Xchange Topic Areas



- **Queue Management and Cost Allocation**
 - Technology, regulation, administration, and organizational change focus
 - *What innovative interconnection solutions exist?*
- **Grid Engineering Practices and Standards**
 - Engineering and technology focus
 - *How can proposed solutions be executed?*
- **Equity and Energy Justice**
 - Multidisciplinary
 - *Who is impacted by and benefits from proposed solutions?*
- **Data Transparency**
 - Multidisciplinary
 - *What transparency concerns must be addressed?*
- **Interconnection Workforce and Training**
 - Multidisciplinary

Additional subjects, like capacity maps, cross these topics and will be addressed from these different perspectives. Follow the schedule of events on the i2X website.



Upcoming Solution e-Xchanges to Consider Joining

1. July 26, 2-4 p.m. ET: Implementing QM/CA reforms
2. July 27, 12-2 p.m. ET: Identifying Solutions to Equitably Scaling the Interconnection Workforce
3. August 1, 1:30-3:30 p.m. ET: Electric Vehicle Charging Stations
4. August 2, 2-4 p.m. ET: Defining Distribution, Sub-Transmission, Transmission, & BPS Interconnection

Follow the schedule of events on the i2X website.

<https://www.energy.gov/eere/i2x/i2x-solution-e-xchanges>

Virtual Meetings Code of Conduct



1. *Assume good faith and respect differences*
2. *Listen actively and respectfully*
3. *Use "Yes and" to build on others' ideas*
4. *Please self-edit and encourage others to speak up*
5. *Seek to learn from others*



Mutual Respect . Collaboration . Openness

Speaker Introductions



Introductions

- Cynthia Finley: Interstate Renewable Energy Council, Workforce Program Vice President
- Radina Valova: Interstate Renewable Energy Council, Regulatory Program Vice President
- Mark Sims: PJM, Senior Manager - Interconnection Analysis
- Brian Conroy: RLC Engineering, Manager of Power System Studies

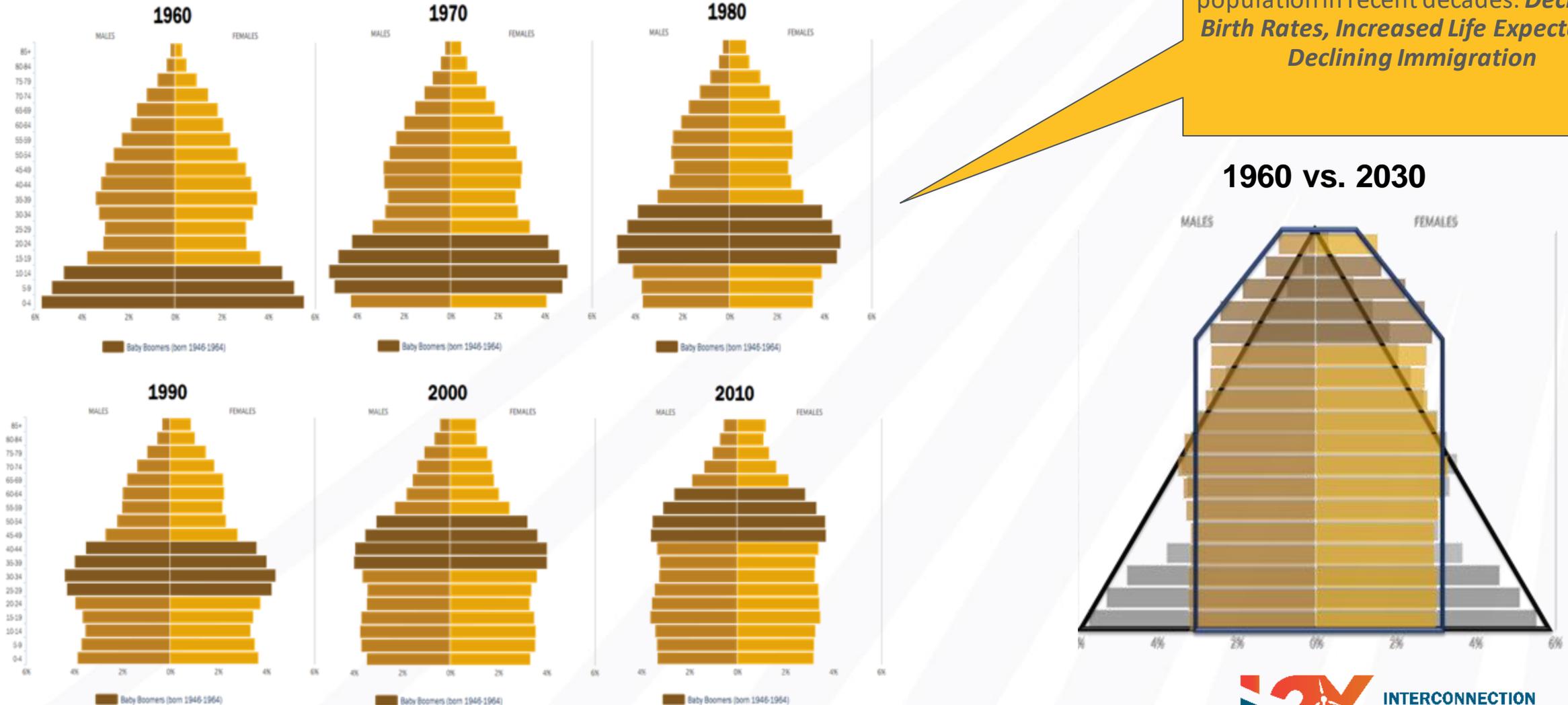
What Can We Learn from Clean Energy Workforce Development?



Clean Energy Workforce Development Best Practices

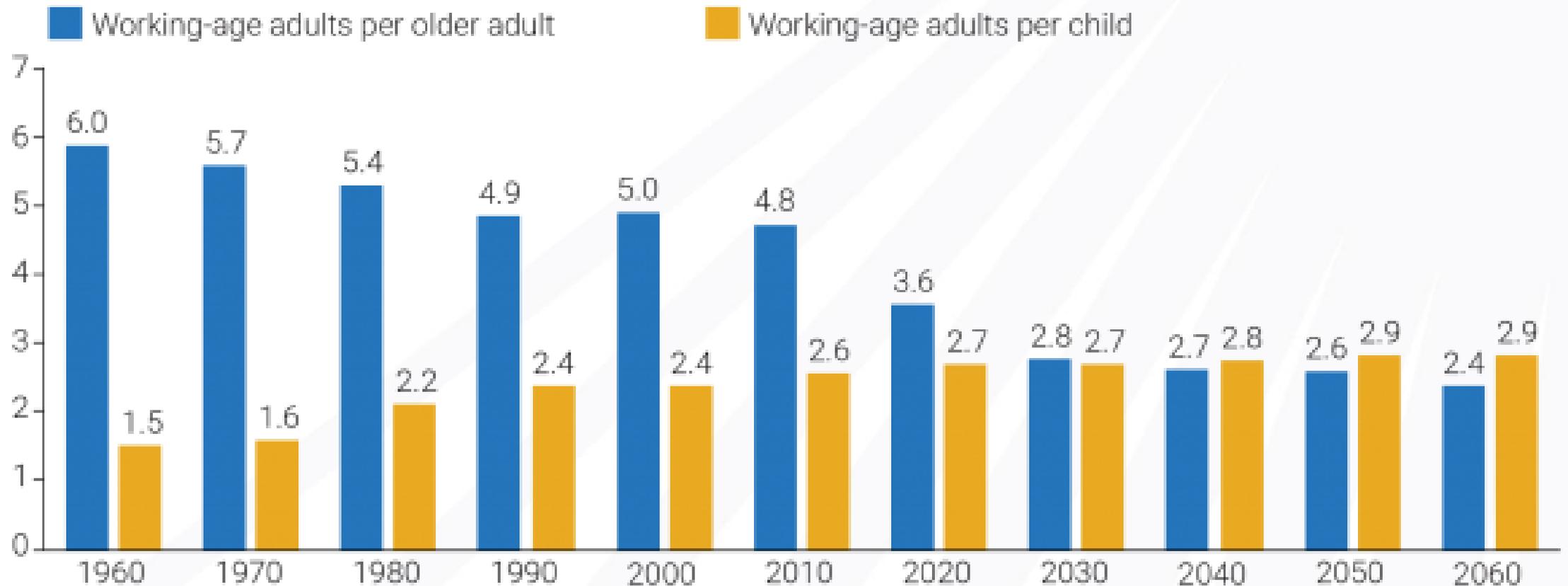
Big picture Labor Market Demand

Three demographic trends account for changes in the age structure of the U.S. population in recent decades. **Declining Birth Rates, Increased Life Expectancy, Declining Immigration**



Clean Energy Workforce Development Best Practices

Big picture Labor Market Demand- scaled down to specific needs. Demographic Trends



Clean Energy Workforce Development Best Practices

- External Consideration:
 - Demographic Trends
 - Changing Views on Work
 - Post-Secondary Enrollment Trends: US colleges have lost more than 2 million students in the last decade
 - Employer needs: 40% of HR leaders say that their organization has felt the negative impact of the present talent shortage. And before this decade is over, the shortage of educated workers is projected to be extreme
 - Collaboration with Higher Education: Colleges should be proactive about understanding the needs of employers and developing responsive programs to help meet their workforce needs
 - Identify the process of workflow to determine knowledge, skills, and abilities as well as determine a baseline for growth

Clean Energy Workforce Development Best Practices

- Sector Strategy Approach:
 - **Targets a specific industry or cluster of occupations**, developing a deep understanding of the interrelationships between business competitiveness and the workforce needs of the targeted industry
 - **Intervenes through a credible organization, or set of organizations**, crafting workforce solutions tailored to that industry and its region
 - **Supports workers in improving their range of employment-related skills**, improving their ability to compete for working opportunities of higher quality
 - **Meets the needs of employers**, improving their ability to compete within the marketplace
 - **Creates lasting change in the labor market system to the benefit of both workers and employers**

Initial Stakeholder Feedback on Interconnection Workforce Challenges and Solutions





What are the most significant challenges with hiring and/or retaining staff engaged in interconnection?

There is a lot of competition within the workforce, particularly for engineers

Interconnection requires in-depth technical expertise

Salaries for interconnection-related positions are not always competitive, particularly at PUCs and utilities

The process of reviewing interconnection applications can be repetitive and monotonous

There are not enough training and education programs to scale interconnection-related positions

Transmission and distribution interconnection requires skills that are not always directly transferrable, which requires specialized training and makes mobility between the two systems challenging for the interconnection workforce

Interconnection workforce challenges are even greater for cooperative and municipal utilities, who don't always have engineers on staff and are likely to face more interconnection applications in the future



What are the potential solutions to interconnection workforce challenges?

Establish more training and education programs for junior engineers to grow and remain within the profession

Automate tasks within the interconnection review process, where possible, to expedite the process and reduce personnel hours needed

Establish more training and education programs to encourage people to join the interconnection workforce and learn through experience (example: DOE Clean Energy Innovator Fellowship)

Key Questions Regarding the Interconnection Workforce



Key Information-Gathering Questions

- Which tasks in the interconnection process, can be automated while still ensuring safe and reliable interconnection?
- How do we estimate the average personnel hours necessary to process interconnection applications for the various levels of review at the distribution and transmission level?
- Can we further break down the average personnel hours for all professions involved in developing and implementing interconnection procedures (policy specialists, engineers, attorneys, etc.)?
- If yes, can we use that data to estimate the number of personnel hours that will be necessary to process the increasing numbers of interconnection applications between today and 2025? 2030? 2050?

Case Study: FERC Order No. 845 Reporting

- FERC Order No. 845 requires:
 - RTOs to “post interconnection study metrics to increase the transparency of interconnection study completion timeframes”
 - If an RTO exceeds study deadlines “for more than 25 percent of any study type for two consecutive quarters,” the RTO must “aggregate the total number of employee-hours and third-party consultant hours expended towards interconnection studies”
- To date, this is the only known source of data related to the interconnection workforce
- Challenges with this type of reporting:
 - Reports are focused on interconnection studies, not the process as a whole
 - Reports don’t disaggregate RTO staff / contractor hours and transmission owner hours

Questions?



Panel Discussion



Discussion Questions



